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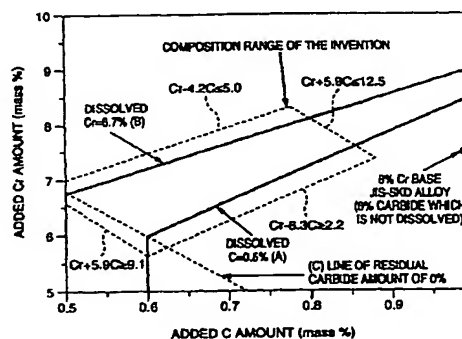
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(54) Tool steel with excellent workability, machinability and heat treatment characteristics, and die using same

(57) Provided is a tool steel which contains, by weight, C and Cr in both of which  $(Cr + 5.9 \times C)$  is 9.1 to 12.5,  $(Cr - 4.2 \times C)$  being not more than 5 and  $(Cr - 6.3 \times C)$  being not less than 2.2. In addition to these elements, this tool steel preferably contains 0.1 to 0.6% Si, 0.1 to 1.2% Mn, at least one of Mo and W of 0.6 to 1.25% in total in terms of  $(Mo + 1/2W)$ , less than 0.5% V, not more than 0.12% S, not more than 100 ppm of Ca, and the balance Fe and incidental impurities. Moreover, in this tool steel, the Cr segregation range in matrix after hardening is not more than 1% by weight, or the maximum tempering hardness by tempering at a temperature of not lower than 500°C is not less than 57 HRC, or a size variation due to heat treatment occurring by tempering at a temperature of not lower than 500°C is not more than 0.1% relative to the size measured just before hardening in terms of linear expansion coefficient and a size variation due to heat treatment by tempering at 490°C is not more than 0. Provided is also a die made by tempering the steel of the invention to a hardness of not less than 55 HRC and cutting the steel.

**FIG.2****EP 1 072 691 A3**



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# EUROPEAN SEARCH REPORT

Application Number  
EP 99 12 3519

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